

**REHABILITATION OF BRIDGE NOS. 02514A AND B
I-95 SB OVER THAMES RIVER, SR 635 (WILLIAMS STREET),
RAILROADS, AND LOCAL ROADS
NEW LONDON AND GROTON, CT
STATE PROJECT 94-252**

**TRANSPORTATION
MANAGEMENT PLAN**

JULY, 2016

FINAL DESIGN

Prepared for:

Connecticut Department of Transportation
2800 Berlin Turnpike
Newington, CT 06131



Prepared by:

VN Engineers, Inc.
116 Washington Ave.
North Haven, CT 06473



TABLE OF CONTENTS

| | |
|---|----|
| Abbreviations | iv |
| Definitions and Terminology | v |
| 1. Introduction | 1 |
| 2. Project Description | 1 |
| 3. Existing and Proposed Conditions | 2 |
| 4. Work Zone Impacts Assessment | 2 |
| 5. Selected Work Zone Impact Management Strategies | 4 |
| 6. Temporary Traffic Control (TTC) Plan | 5 |
| 7. Transportation Operations Plan | 7 |
| 8. Public Outreach/Public Information (PO/PI) Component | 9 |
| 9. Transportation Management Plan (TMP) Monitoring | 12 |
| 10. TMP Roles and Responsibilities | 13 |
| 11. Implementation Summary and Contact Information | 16 |

LIST OF FIGURES

| | |
|--------------------------------------|---|
| Figure 1: Project Location Map. | 1 |
|--------------------------------------|---|

LIST OF TABLES

| | |
|---|----|
| Table 1: Estimated 2014 traffic volumes. | 2 |
| Table 2: Overview of TMP responsibilities by organization. | 15 |
| Table 3: Summary TMP Action Plan. | 17 |
| Table 4: Contact information for TMP-related organizations..... | 18 |

ABBREVIATIONS

| | |
|------------|---|
| ADT | Average Daily Traffic |
| BOC | Bridgeport (Traffic) Operations Center |
| ConnDOT | Connecticut Department of Transportation |
| CHAMP | Connecticut Highway Assistance Motorist Program |
| CMS | Changeable Message Sign |
| FHWA | Federal Highway Administration |
| <i>HDM</i> | ConnDOT <i>Highway Design Manual</i> |
| IMS | Incident Management System |
| M&PT | Maintenance and Protection of Traffic |
| MUTCD | Manual on Uniform Traffic Control Devices |
| PE | Preliminary Engineering |
| PO/PI | Public Outreach/ Public information |
| PS&E | Plans, Specifications, and Estimate |
| SOV | Single Occupant Vehicle |
| TAVS | ConnDOT Traffic Accident Viewing System |
| TMO | Transportation Management Organization |
| TMP | Transportation Management Plan |
| TO | Transportation Operations |
| TPCBC | Temporary Precast Concrete Barrier Curb |
| TTC | Temporary Traffic Control |

DEFINITIONS AND TERMINOLOGY

| | |
|---|---|
| Consulting Engineer | An engineering firm contracted by ConnDOT to undertake various preconstruction activities including preliminary engineering, preliminary design and final design. The consulting engineer for this project is Prime AE Group, Inc. |
| Demand Management | Improvement of transportation system efficiency by altering transportation system demand through management of pricing, services, employment-based actions, such as staggered work hours and telecommuting, and regulations, rather than capital improvements. |
| DOT Communications | Office of Communications, ConnDOT |
| DOT Construction | The collection of entities responsible for administering the construction contract, which may include the DOT Office of Construction, DOT District 2 Construction and a consulting engineering firm that provides a resident engineer, inspection and supporting personnel. |
| DOT Consultant Design | Consultant Design Division, ConnDOT |
| DOT Highway Operations | Office of Maintenance, Highway Operations, ConnDOT |
| DOT Traffic Engineering | Traffic Engineering Division, ConnDOT |
| Federal Highway Administration Work Zone Safety and Mobility Rule | 23 CFR Part 630, Subpart J as published in the <i>Federal Register</i> ; Vol. 69, No. 174; September 9, 2004 |
| Incident Management | The procedures and practices used to identify and respond to incidents, including the management of transportation consequences. |
| Maintenance and Protection of Traffic | A term used explicitly as a ConnDOT specification, pay item and part of a <i>Highway Design Manual</i> chapter title. It is also used more broadly to describe work zone traffic management. |
| Public Outreach/Public Information Program | A set of communications strategies used to inform affected road users, the general public, area residences and businesses, and appropriate public entities about the project, the expected work zone impacts, and the changing conditions on the project. |

| | |
|--|---|
| Significant Project | A stationary highway construction or maintenance activity which causes sustained mobility impacts on I-84, I-91, I-95, I-291, I-384, or I-691 for more than three (3) days with either intermittent or continuous lane closures. In addition, any highway construction or maintenance activity that alone or in combination with other concurrent activities nearby, which is expected based on engineering judgment, to cause sustained mobility impacts that are considered greater than what is considered tolerable relative to typical traffic operations experienced in the area of the work zone, may be declared a significant project. |
| Temporary Traffic Control Plan | A plan describing the TTC measures to be used for facilitating road users through a work zone. |
| Transportation Management Organization | A voluntary association of public and private agencies and firms joined to cooperatively develop transportation-enhancing programs in a given area. Transportation Management Organizations typically manage transportation demand in congested urban and suburban communities. |
| Transportation Management Plan | The strategies selected to manage the work zone impacts of a project. The scope, content, and degree of detail are commensurate with the expected work zone impacts. The TMP for a significant project includes TTC, TO and PO/PI components. For projects with less substantial work zone impacts, the TMP may consist only of a TTC Plan. |
| Transportation Operations Component | The TMP component that identifies strategies to mitigate work zone impacts on operation and management of the transportation system within the work zone impact area. |

1. Introduction

This Transportation Management Plan (TMP) was developed pursuant to the Connecticut Department of Transportation (ConnDOT) “Policy on Systematic Consideration and Management of Work Zone Impacts” (Policy Number E&H.O.-57) and the associated Implementation Plan, dated August 6, 2007. The ConnDOT policy conforms to the updated Federal Highway Administration (FHWA) Work Zone Safety and Mobility Rule. This project is in final design and must therefore comply with the FHWA Work Zone Safety and Mobility Rule. This TMP was prepared during final design and reflects decisions made during earlier phases and actions planned for the future, including construction-phase measures.

2. Project Description

Proposed Project No. 094-252 involves the following construction items:

- Parapet modifications for overhead sign replacement
- Structural steel repairs on girders & truss members
- Patching, membraning, and overlaying the existing bridge deck
- Joint replacement
- Replacement of sliding expansion bearings on the ramp, Bridge No. 02514B

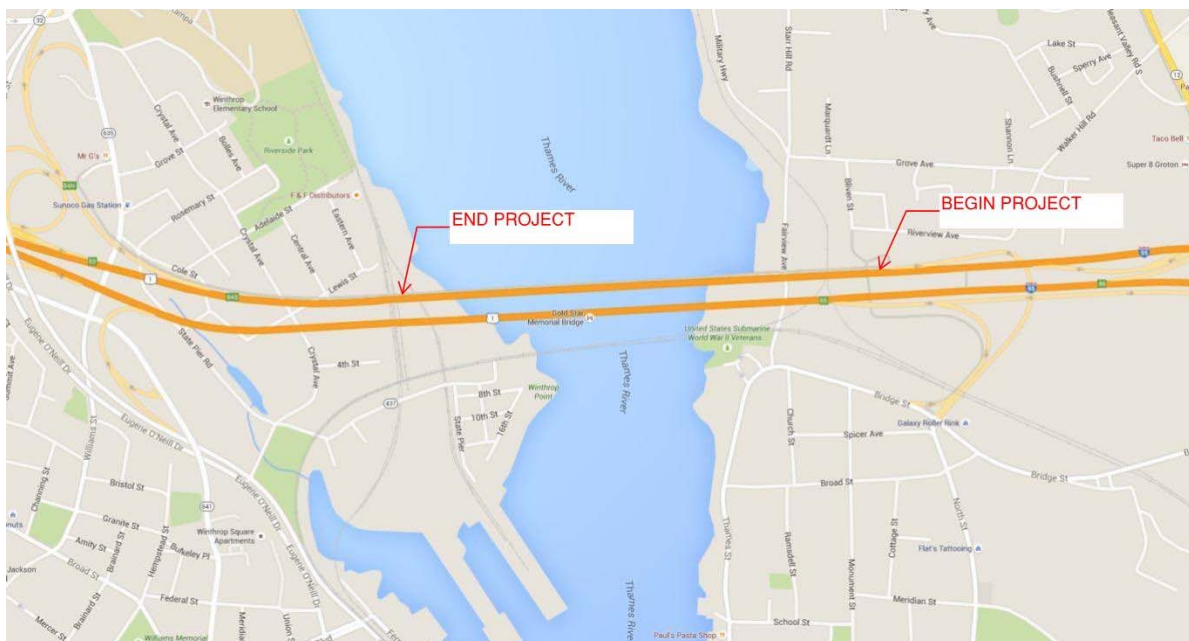


Figure 1: Project Location Map.

The project will be funded with several funding sources and categories, including

Federal aid administered by the FHWA. The project is subject to FHWA oversight (i.e., non-exempt) based on its (Interstate) location and cost. Consequently, the Plans, Specifications and Estimate (PS&E) are subject to FHWA approval.

3. Existing and Proposed Conditions

The construction project and work zone will encompass 1.2 miles of southbound I-95, within the city limits of New London and Groton. The functional classifications and traffic data for highways and streets directly impacted by construction are shown in Table 1. Traffic volumes and operational analysis were carefully considered in developing work zone strategies and mitigation measures.

Table 1: Estimated 2014 traffic volumes.

| Roadway | Classification |
|---------|---|
| I-95 SB | Urban Principal Arterial Freeway – Interstate |

Design Traffic Volumes

| Roadway | ADT (Existing Vehicles per Day) |
|--------------------------------|------------------------------------|
| I-95 SB | 54,900 |
| I-95 SB On-Ramp from Bridge St | 6,600 |

Traffic volumes based upon data provided by the Connecticut Department of Transportation counted May-Jun-July of 2014. Land use throughout the project is mixed with some sections being highly urbanized. There is a pedestrian and bicycle path located on the north side of I-95 southbound that accommodates pedestrian crossings.

4. Work Zone Impacts Assessment

Transportation impacts such as queueing emanate from work zones as normal traffic operations are disrupted. A qualitative assessment of impacts was conducted based on project context, scope and the selected strategies. Previous relevant experience, interdisciplinary reviews and consultation with local officials were employed to gauge anticipated impacts. In some cases, discretion was employed to essentially “draw a line” between tolerable and unacceptable impacts. These judgments are the basis for selecting fundamental work zone strategies (e.g., minimum number of lanes required at a particular day/time). This section outlines various categories of impacts and mitigation measures.

User Safety– Work zones represent an incremental elevation in motorist risk. Work zones can also disrupt other travel (e.g., bicyclists, pedestrian) patterns. Despite extensive research, the specific factors that elevate accident risk within work zones are

uncertain. Consequently, reliance was placed on subjective knowledge and institutional processes (e.g., review by the Division of Traffic Engineering, use of typical installations, adherence to highway safety principles) to identify and mitigate risk factors. For example, the concept of “positive guidance” was employed to establish easy-to-follow temporary travel paths. Also, roadside safety principles were used to create separation (e.g., distance and/or barrier) between unavoidable roadside hazards and active travel lanes. Based on traffic volumes, composition (percent of heavy vehicles) and operating speeds, Route I-95 SB mainline and ramps are the elements with the greatest potential for adverse safety experience.

Worker Safety—National statistics indicate that highway construction workers have substantially higher work-related injury and death rates than the general population of construction workers. Some worker risks can be mitigated by programmatic and project-level measures. Driver awareness, positive guidance, protective clothing and positive protection strategies are included in this project. These concepts are implemented primarily through TTC provisions (e.g., TPCBC layout, device design, and specifications related to flagger training and safety garments).

Emergency Services— The work zone will affect but not degrade emergency medical, law enforcement and fire service responses. Route I-95 SB and the surrounding side streets will remain open throughout the project, except for infrequent, short-duration closures. Emergency responses using these facilities will not be significantly affected. However, attempting to use a closed road could cost valuable response time. Therefore, advance notification of implementing and revising detour routes will be provided.

Transit Service— The work zone will affect fixed-route bus service. As detailed in the Transportation Operations element, Southeast Area Transit District (SEAT) operates bus routes that cross or run parallel to the project site on I-95 southbound.

There are no bus stops in the project location but SEAT should be made aware of possible delays on routes over the Bridge.

Route I-95 SB Connectivity and Traffic Operations—Except for intermittent, short-duration closures, Route I-95 SB will be open throughout the project meaning there will be no detours of mainline I-95 SB through the project area. The minimum number of directional lanes open to traffic is specified as three or four, depending on the day of the week and time of day, although the existing number of directional travel lanes (i.e., three or four) will be maintained during peak periods. The effects on traffic operations can be expressed using measures such as delay, user cost or queue length. However, available quantitative estimating techniques and tools have not proven consistently accurate across the broad range of project applications. Therefore, this impact assessment is based primarily on institutional knowledge and previous experience with similar facilities. Construction will affect the mainline and ramps within the project area. The TTC Plans and special provisions identify the required ramp travel way geometry and periods of permissible deviation.

Traffic operation effects are related to work zone capacity reduction. The number of mainline travel lanes open to traffic will vary. The minimum number of directional lanes open to traffic is specified as one, two or three, depending on the day of the week and time of day. The existing number of directional travel lanes will be maintained during peak periods with only off-peak lane closures. Long term shoulder closures are

required for parapet modifications for overhead sign replacement.

The maximum height and width of vehicles that may be operated on Connecticut highways, without a permit, are 13 feet-6 inches and 8 feet-6 inches, respectively. The alignment, cross section (including temporary concrete barrier curb) and temporary construction support systems (e.g., false work, stays, sign supports) are designed and specified to accommodate (i.e., provide adequate horizontal and vertical clearances for) vehicles of these dimensions.

Based on historically completed Route I-95 SB projects, the impact of the selected work zone strategy on Route I-95 SB operations is not expected to be intolerable. However, the actual effects (e.g., delay, queue lengths) will be monitored during construction and, if congestion reaches an unacceptable level, additional mitigation measures will be investigated.

Coordination must be maintained with the adjacent project, SPN 094-235 Gold Star Memorial Bridge I-95 NB over Thames River, Amtrak & Local Roads.

Traffic Incident Occurrence and Response – Traffic incidents within the work zone are inevitable and work zone conditions (e.g., unusual construction operations) may occasionally become incidents. Further, work zone conditions will probably magnify the effect of some incidents, especially along Route I-95 SB where the work zone typical section provides for shoulder closures. An established, permanent, multi-function incident management program will be utilized, as described under the Transportation Operations element.

Surface Street Traffic Operations– There are no detours anticipate so surface street traffic operations should not be affected.

The TMP includes mitigation measures for the impacts described in this section.

5. Selected Work Zone Impact Management Strategies

This TMP was developed to accommodate the required construction operations and manage work zone effects on transportation and transportation-dependent services and facilities. Strategies were selected to mitigate (i.e., reduce or eliminate) access, mobility and safety impacts. This section outlines the general approach used to select transportation management strategies. The work zone will directly impact two facility types (i.e., Route I-95 SB directional roadways and ramps). Overall TMP development and management strategy selection were guided by the objectives set forth in ConnDOT's policy, dialogue with project stakeholders and prevailing standards, policies and practices including relevant provisions of the *Manual on Uniform Traffic Control* (MUTCD) and ConnDOT *Highway Design Manual*, particularly the chapter on Maintenance and Protection of Traffic Through Construction Zones (Chapter 14).

Negative transportation impacts of any scale or duration are undesirable but, as a practical matter, some impacts cannot be reasonably avoided. TMP development is an iterative, rather than linear, process. Revisions are inevitable as the consequences (e.g., safety, operations, cost) of tentative decisions and options become known. Certain basic strategy decisions were made on the basis of experience and qualitative judgment. These decisions, mostly related to temporary traffic control, were subjected to further review as outlined in the previous (Work Zone Impacts Assessment) section. Following the selection and review of basic strategies, supporting and mitigating measures were

identified. The rationale for the basic traffic management strategies for individual facilities follows.

As the backbone of vehicular traffic through south and eastern Connecticut, Route I-95 southbound carries an ADT of approximately 54,900 vehicles per day, providing for goods movement and journey-to-work and personal travel. Therefore, preserving the current number of Route I-95 SB travel lanes during periods of high demand is a core TMP strategy. Through the project area mainline I-95 SB consists of two-three through travel lanes (i.e., excluding operational lanes and shoulders) in each direction. Based on the necessities of construction and temporal traffic demand fluctuations, the M&PT includes schedules that define the minimum number of travel lanes (one, two, three), by week, day and time, for each direction of travel.

The strategies described above are the foundation work zone impact management strategies. Using a framework of the three TMP components, subsequent sections identify and elaborate on strategies.

The ConnDOT Implementation Plan addresses a number of planned programmatic (rather than project-level) initiatives that will advance the agency's progress toward a more mature work zone management framework. These programmatic initiatives include training, data collection and reporting, data retention and analysis and field monitoring. This TMP does not include any information on those subjects.

6. Temporary Traffic Control (TTC) Plan

The TTC Plan supports the TMP objectives of efficient transportation and the safety of workers, motorists and other users. The TTC Plan draws heavily on a body of ConnDOT knowledge, references and experience, including *HDM* Chapter 14, standard drawings and typical installations, adapted to the project context where appropriate. In practical terms, the following are significant TTC Plan elements:

- Directing mainline I-95 southbound traffic onto and along temporary travel lane patterns,
- Shielding permanent and temporary roadside hazards

Nearly all aspects of the TTC Plan are developed during design (preconstruction) and implemented during construction. The TTC Plan will be implemented primarily through the construction contract, by the construction contractor, with oversight by DOT Construction personnel and inspectors. TTC provisions within the contract documents include plans, standard specifications and special provisions. Key TTC Plan components and elements include:

Stage Construction Plans – identify I-95 SB mainline and ramp work areas, by type (i.e., temporary pavement, permanent features etc.) for each phase, along with temporary concrete barrier curb, attenuation systems, temporary pavement markings and signs.

M&PT Miscellaneous Details – provide typical construction cross section and inertial barrier layouts.

Standard Specifications and Supplement – standard specifications (as supplemented) pertain to all projects, if applicable, unless amended by a special provision. Many standard specifications are relevant to the TTC Plan for this project. The Maintenance and Protection of Traffic standard specification (Section 9.71) covers

the most generic requirements, including a requirement that the Contractor “keep the roadway under construction open to traffic for the full length of the project and provide a sufficient number of travel lanes and pedestrian passways to move that traffic ordinarily using the roadway.” Additionally, many other standard specifications govern specific TTC Plan features (e.g., temporary traffic control devices, sign materials). The standard specifications are augmented by special provisions.

Special Provisions – numerous recurring and project-specific special provisions cover TTC Plan elements, including the following:

SECTION 1.08 - PROSECUTION AND PROGRESS–describes the TCC in detail and provides a detailed written description of the work to be completed in each Stage of the TTC. This document also contains tables indicating the minimum number of lanes that must remain open during a given time period. This special provision also includes the allowable work hours for the construction. It also includes sections on signing requirements, concrete slab repairs, loop detector installation and other limitations.

(Section 9.71.01) – MAINTENANCE AND PROTECTION OF TRAFFIC–describes the minimum number of lanes, lane width and work periods allowed for the different areas of the project. This special provision also includes sections on the following items:

Requirements for Winter – requires the contractor to schedule a meeting with representatives of the Engineer, Maintenance and Traffic to determine what interim traffic control measures the Contractor must accomplish for the winter to provide safety to the motorist and permit adequate snow removal procedures.

Stage Construction – requires the contractor to maintain and protect traffic on all project roadways as shown on the Maintenance and Protection of Traffic Plans contained in the contract plans.

Commercial and Residential Driveways – requires the contractor to maintain access to and egress from all commercial and residential driveways throughout the project limits. The Contractor will be allowed to close said driveways to perform the required work during those periods when the businesses are closed unless permission is granted from the business owner to close the driveway during business hours.

Signing Patterns – requires the contractor to erect and maintain all signing patterns in accordance with the traffic control plans. Proper distances between advance warning signs and proper taper lengths are mandatory.

Signing – requires the contractor to maintain all existing overhead and side-mounted signs throughout the project limits during the duration of the project. The Contractor shall temporarily relocate existing signs and sign supports as many times as deemed necessary and install temporary sign supports and foundations if necessary and as directed by the Engineer. Signs that are in conflict shall be removed and/or covered with an opaque material.

Interim Pavement Markings – requires the contractor to install painted pavement markings, which shall include lane lines (broken lines), shoulder edge lines, stop bars, lane-use arrows and gore markings, on each intermediate course of bituminous concrete pavement and on any milled surface by the end of the work day/night.

Final Pavement Markings – requires the contractor to install permanent Pavement Markings at the time of installation of the final course of bituminous concrete pavement.

This special provision includes several other pertinent items that are required of the contractor during construction.

Payment Provisions – The PS&E will include pay item provisions for implementing the TMP, particularly the TTC Plan. Items are paid for either as lump sum or unit basis. From a construction contract administration perspective, it is easier to implement changes for items covered by individual (unit-based) pay items. Since construction inevitably brings some unanticipated conditions, construction-phase flexibility is needed. Numerous TMP and TTC items are paid for an individual/unit basis, including:

- Temporary Precast Concrete Barrier Curb (TPCBC)
- Relocated TPCBC
- Traffic persons (3 categories)
- Barricade Warning Lights, High Intensity
- Traffic Cone
- Traffic Drum
- Construction Barricade Type III
- Temporary Illumination Unit
- Remote Control Changeable Message Sign
- High Mounted Internally Illuminated Flashing Arrow
- Temporary Cantilever Sign Support
- Temporary Overhead Sign Support
- Hot-Applied Painted Pavement Markings (4 categories)
- White Epoxy Pavement Markings (3 categories)
- 4 Inch Yellow Epoxy Pavement Markings
- Epoxy Resin Pavement Markings, Symbols and Legends
- Construction Signs
- Type D Portable Impact Attenuation System
- Temporary Impact Attenuation System Module (5 categories)
- Relocation of Temporary Impact Attenuation System Module (5 categories)

The TTC Plan includes many other elements of a routine nature, not specifically identified in this document.

7. Transportation Operations Plan

The Transportation Operations (TO) Plan is a selected set of mitigation strategies based primarily on non-highway-infrastructure systems. Like other TMP elements, the identification of appropriate TO measures is scaled and responsive to project context, including potential impacts, constraints and available resources. The major TO elements

are outlined below.

Demand Management – ConnDOT engages regional Transportation Management Organizations (TMOs) to assist in the delivery of travel demand services. CTRides is a TMO operating in southeastern Connecticut with ConnDOT support. CTRides delivers transportation demand management solutions that improve mobility, workforce effectiveness and quality of life. Its services are free to commuters. CTRides encourages the use of transportation alternatives such as carpooling, vanpooling, bus and train travel, bicycling, walking, compressed work weeks and telecommuting. With regard to the project work zone, ongoing CTRides demand management programs will accommodate travelers that are inclined to make a change in transportation mode and pattern. Peak-period demand will likely be reduced as a result of the Public Outreach/Public Information program. In addition to their routine, ongoing demand management activities, ConnDOT will probably engage CTRides for a project-level assignment as subsequently described in the TMP.

Incident Management – Portions of the Route I-95 SB project are under video surveillance by an Incident Management System (IMS). One camera captures portions of Route I-95 near SB Exit 83, NB Exit 83 and another at SB Exit 86. Standard practices include the posting of project information which is accessible from the ConnDOT homepage <http://www.ct.gov/dot/site/default.asp> Travel Resource page that includes links to “Traffic Incidents,” CT Travel Info Map,” and “Traffic Cams.” “CT Travel Info” is an interactive map displaying icons for ongoing active construction projects, roadway incidents, traffic cameras images, and CMS sign displays by location. Additionally, motorists can sign up for e-mail news and traffic alerts. The E-Traffic Alerts are sent via e-mail when there is a traffic incident that will affect travel in a specified area of the state and the E-News alert sends information on general and construction news (press information) issued by the Department.

The Connecticut Highway Assistance Motorist Program (CHAMP) is operated by ConnDOT and provides service throughout the mainline I-95 SB portion of the project. Services include pushing disabled vehicles to the shoulder, fuel, changing flat tires and jump starts. Service patrols also react to accidents and notify the State Police, medical, fire and/or other emergency responders. The incident management systems, protocols and interagency coordination in effect prior to the project and outside the work zone limits will be employed for the work zone. The link to the CHAMP website is: <http://www.ct.gov/dot/cwp/view.asp?a=2094&Q=259404>. Standby wrecker service is also recommended during peak hours.

Police Presence – An active project-level State Police presence is planned. The role, conduct, cost and reimbursement provisions for State Police personnel utilized for traffic control on ConnDOT-administered construction projects are covered by a Memorandum of Understanding between ConnDOT and Connecticut Department of Public Safety. State Police will be utilized for traffic control on Route I-95 SB, the only high-speed facility being affected by this project. Additionally, State Police may be requested to provide enforcement within a work zone. DOT Construction will request work zone enforcement if warranted by observed conditions (e.g., excessive operating speeds). Local Groton/New London police personnel may also be utilized for traffic control on non-highway roads.

Continuity of Transit Service – CTTransit operates fixed-route commuter and

city bus service. Construction operations and the associated M&PT will impose direct and indirect impacts to this service. The aforementioned routes will be indirectly affected by the construction and part of the route will be within the work zone, but the entire route will remain open to traffic. Inconvenience to bus passengers is anticipated to be minor and tolerable.

ConnDOT Construction will provide CTTransit with two weeks of notice prior to implementing or revising detours. If detours are required, CTTransit will select the temporary route and provide advance notice of the revisions. There are no bus shelters located in the work zone. This will require only the bus stop signs be relocated if needed.

Continuity of Emergency Services – ConnDOT personnel have met with local officials, including the fire and police chiefs, during the course of project development to ensure continuity of emergency services. The scope of the project and planned detours were reviewed. Fire and police input was integrated into the design. Coordination with emergency service providers will continue through completion of design and construction.

Work Zone Safety Meetings – Prior to construction, a meeting will be convened to review traffic control requirements. ConnDOT Construction, contractor and state and local police personnel will participate. Subsequent meetings of similar scope and representation will be held as needed.

8. Public Outreach/Public Information (PO/PI) Component

The Public Outreach/Public Information (PO/PI) component of the TMP includes both programmatic and project-level communications strategies. Programmatic measures are intended to create a general awareness of important work zone issues (e.g., motorists and worker safety, legal provisions and sanctions). Project-level measures provide information about a specific work zone to the people and organizations that will be directly affected.

Public involvement and information are scaled to the probable intensity and extent of impacts. The transportation effects resulting from this project work zone are expected to be noticeable but not profound. The overall project PO/PI effort will address transportation effects and other subjects of interest (e.g., nature of improvements, right of way acquisition, construction schedule). The outreach is being conducted in conformance with ConnDOT's "A Guide for Public Outreach," which includes the Department's Public Outreach Policy. The policy and guidance cover the gamut of project development and implementation, including the construction phase. The information presented here will focus on PO/PI activities related to work zone transportation effects and mitigation measures.

Programmatic Work Zone Public Awareness – ConnDOT disseminates general work zone safety information (i.e., not related to a specific project) via the work zone safety page of the agency's Web site: <http://www.ct.gov/dot/cwp/view.asp?a=1410&q=417232>. This page, portrayed in Figure 2, offers a series of work zone advisories including safe driving tips and videos. Additionally, ConnDOT produces and broadcasts work zone safety messages as paid commercial radio advertising (funded by the National Highway Traffic Safety Administration).

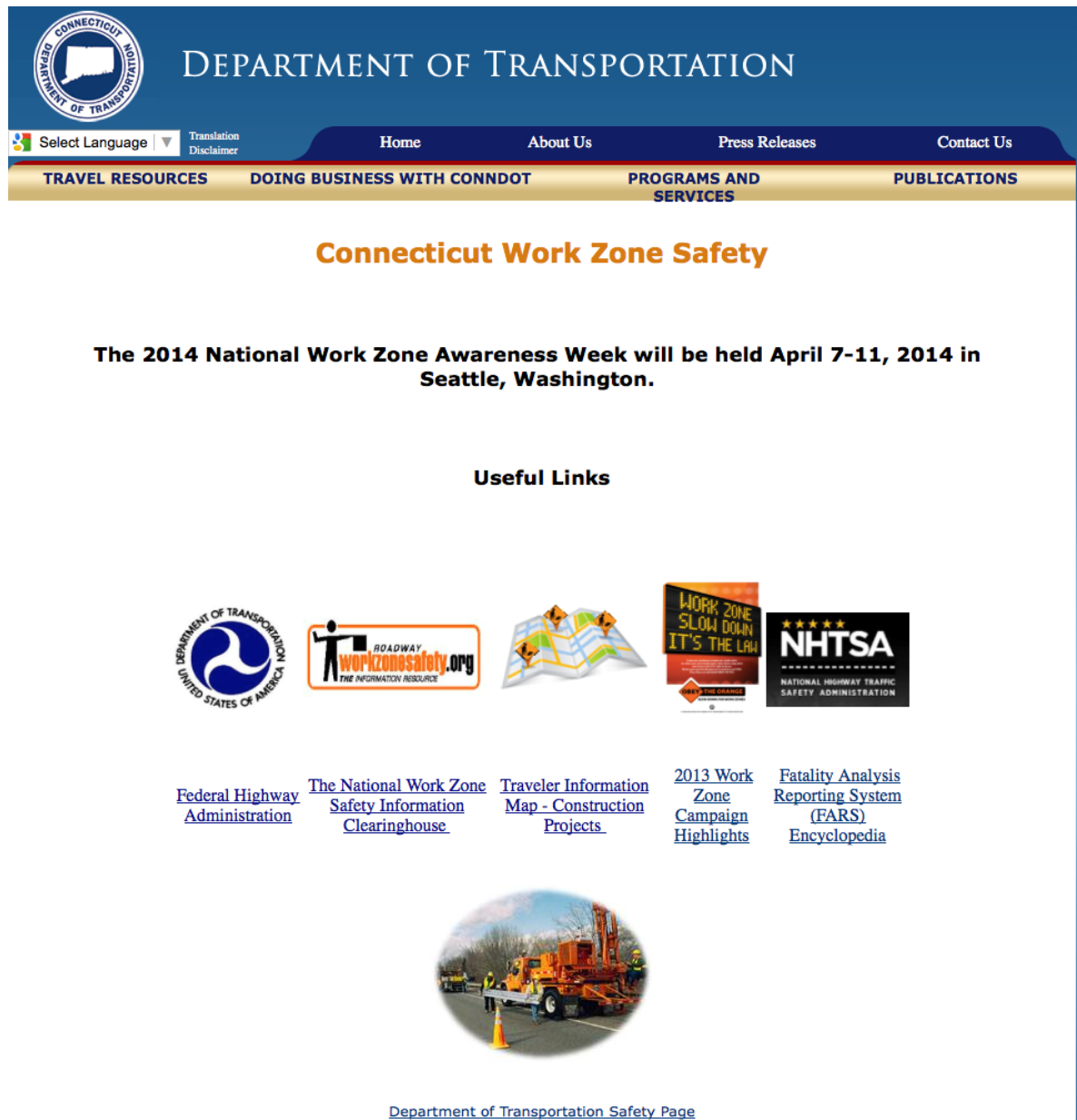


Figure 2: ConnDOT Work Zone Safety Web Page

Public Information Meetings – This type of forum is routinely conducted during design development and serves a variety of purposes. In the context of work zone safety and mobility, the meeting will provide the public with advance notification of construction-phase conditions and transportation impacts. Residents, major employers, shippers, merchants, event organizers, transportation-dependent service providers, utility owners and emergency responders use the information to coordinate their plans with anticipated work zone conditions. A public information meeting was to be held in 2015. Another meeting will be held prior to commencement of construction. Information will be presented on the construction staging and planned detours. After the project begins, the District will hold quarterly public information meetings during construction. Additional meetings will be held if a major change in the traffic pattern occurs. The meeting agendas and presentations will also include other topics not related to work zones. These meetings have proven beneficial for citizens and as a forum for introductions between construction personnel and stakeholders including merchants, property owners, local officials and

emergency response agencies.

Electronically-Disseminated Project Work Zone Information – News releases will be prepared and disseminated in advance of major, planned work zone developments (e.g., beginning of construction, change in configuration). The ConnDOT Construction Manual (Volume 1, Chapter 20) provides a detailed Press Release procedure. A project level assignment for MetroPool is anticipated that will involve developing and disseminating news releases. A simplified overview of the ConnDOT news release procedure, adapted for this project and the probable involvement of MetroPool, is provided here. News releases will be initiated at the project level. The basic information will be passed on to MetroPool for refinement and development into a draft news release. The draft will be reviewed by DOT Construction and DOT Communications. Following review and approval, the release will be posted and disseminated by District 2. The ConnDOT Web home page (<http://www.ct.gov/dot/site/default.asp>) includes a link to sign up to receive updates / newsletters by email as shown in **Figure 6**. An interested party can have these constructed-related news releases delivered automatically by email by subscribing to “E-Traffic Alerts.” Virtually all news organizations (i.e., broadcast and print media) subscribe to this service.



Figure 3: ConnDOT Construction News Web page

Changeable Message Signs – Changeable message signs (CMS) will be utilized to provide real-time information of regional, corridor or location-specific (e.g., interchange, sort segment) relevance. Portable CMS will be provided through the construction contract, located in or near the work zone, and controlled by project personnel.

9. Transportation Management Plan (TMP) Monitoring

The various TMP elements and individual strategies will be monitored during implementation, both to minimize work zone transportation impacts and to assure that State contracts and agreements are administered properly.

TTC Plan Conformance – Nearly all aspects of the TTC Plan are incorporated into the construction contract as described in this document. The construction contractor will be responsible for deploying the specified configurations, devices and conditions. DOT Construction will administer the construction contract on behalf of the state. DOT Construction representatives will review and document a myriad of contractor-provided TTC products, services and conditions (e.g., taper lengths, device design and location, times of lane reduction) in relation to contract provisions. Information will be documented in daily work reports.

On-site Observations – Ongoing, real-time observations by on-site personnel are a primary means of monitoring TMP operations and effectiveness. Contractor, inspection, enforcement/police, and service patrol personnel are likely to observe incidents, situations and recurring conditions of interest and/or concern including queue lengths, persistent/recurring distractions, motorist compliance/non-compliance, errant motorists, systemic conflicts, pedestrian and bicyclist impediments, and hazardous conditions. DOT Construction personnel will record significant observations received from others. Responsive action will vary in consideration of the numerous factors including risk, intensity, persistence and frequency of the effects and the cost and feasibility of potential remediation measures. *Intervention will be immediate for safety-critical situations.* For other observed conditions of concern, DOT Construction may elect to: take no action, initiate change, or seek the advice of a DOT unit such as Consultant Design or Traffic Engineering.

Work zone delay will be estimated by inspection personnel by periodic “speed runs.” Baseline time(s) for the segment (between specific start and end points) will be determined before construction begins. Several baseline times may be developed with corresponding times of day. The estimated work zone delay is the difference between the actual (work zone) drive time and appropriate baseline time. Although unlikely, negative delay values are possible.

Accident Information/Data – Regrettably, and despite extensive preventive measures, work zone accidents do occur. The frequency and severity of accidents is the most relevant indicator of work zone safety. Both informal and structured reviews of work zone accidents are planned. Individual accidents will be informally assessed shortly after notice or the accident report becomes available. Depending on the circumstances such as severity and consistency with pattern, additional countermeasures may be considered and implemented. Often, many factors such as weather, driver characteristics, traffic density and speed, and roadway and vehicle conditions contribute to accident causation. Because of the many variables and possible variable combinations, it is difficult to isolate the main causative factors from the examination of a single accident. Conclusions reached from interpreting large samples are generally more reliable. To utilize the interpretative advantages of larger samples covering a substantial period of time and still undertake timely remedial action, ConnDOT employs a variety of review techniques, including accident data analysis, to assess individual projects and program-wide work zone safety.

10. TMP Roles and Responsibilities

This TMP encompasses a wide variety of impacts, disciplines and activities. Selecting, refining and implementing this far-ranging plan requires an interdisciplinary team approach. Numerous technical and functional disciplines and organizations, each with relevant expertise and domains of responsibility, collaborated in the preparation of this TMP. Similarly, implementation will be carried out by numerous DOT units and external partners. DOT Consultant Design has overall responsibility for preparing the TMP and DOT Construction will have the primary implementation role. Specific information on the roles of various units and organizations is provided below.

Construction Contractor – By definition, the contractor fulfills the specified contract requirements. Intentionally, some aspects of contract documents are very prescriptive and others are more general or qualitative, which allows for a certain level of interpretation and flexibility. Bidder/contractor flexibility is intended to harness innovation and efficiencies. Unfortunately, qualitative and non-explicit specifications can also yield marginal results or performance which cannot be easily redressed.

The TTC Plan will be implemented primarily through construction contract provisions. The detailed methods and duration of specific construction operations and the associated transportation impacts are governed largely by the Contractor, within the flexibility of the contract provisions. Contractor cooperation is essential to attaining the agency-owner objectives. ConnDOT will invite and encourage the development of a cohesive ConnDOT-contractor partnership. If formed, the partnership will pursue reciprocal goals. Based on past experience, partnership goals often include those related to work zones (e.g., timely completion, traveler and worker safety). In addition to the lead role for physically shaping all aspects of the work zone and executing construction operations, the contractor makes other contributions to the TMP. An effective public information program depends on credible information regarding construction operations such as intermittent closures and stage changes. The Contractor develops most of this information. Contractor cooperation and commitment to delivering useful information for packaging and dissemination is essential to success.

Consulting engineer – The consulting engineer for this project is Cardinal Engineering Associates. The consulting engineer develops or assembles nearly all of the contract documents, including M&PT provisions. For this project, the consulting engineer designed all infrastructure elements (e.g., bridges, pavements, traffic control) and prepared all stage construction, the Temporary Traffic Control Plan and numerous work zone related special provisions. Hence, a single organization is responsible for designing the improvements and the corresponding work zones. The consulting engineer will be available to support Connecticut DOT during construction, especially in situations requiring detailed familiarity of design decisions and design modification. Consulting engineer assistance may be needed during TTC Plan implementation.

DOT Communications - The Office of Communications is responsible for ConnDOT's news and information. As it relates to this project, DOT Communications will review/approve, release and post project-related information. Draft news releases will be initiated at the project level and advance through a review process within DOT Construction. Press releases will be available and disseminated through various media as described in the Public Outreach/Public Information component.

DOT Construction – Award of the construction contract demarks a transfer of principal responsibility between ConnDOT units, from Consultant Design to Construction. In the context

of this document, DOT Construction encompasses several entities that specialize in construction-related activities including the Office of Construction (located in Newington), District 2 Construction (located in Norwich) and consultant inspection personnel. The consultant inspection team is headed by a resident engineer, who is the principal fulltime, on-site contract administrator and point of contact with District 2 Construction. For simplicity and despite their distinctive roles, these groups (i.e., Office of Construction, District 2 Construction, consultant resident engineer and inspection staff) are referred to as DOT Construction.

DOT Construction will administer the construction contract on behalf of the state. Attaining compliance with the TTC Plan is an inherent part of this role. As the ConnDOT unit that deals directly with the contractor and the one nearest execution of the work, numerous other roles are also assigned to DOT Construction, including overall responsibility for monitoring the TMP. This will involve observing and documenting various conditions (e.g., TTC patterns, recurring conflicts, device conditions), events (e.g., incidents, contractor interactions) and performance data. DOT Construction will interface with abutting property owners, elected officials, emergency responders, municipal officials, State Police, transit officials and individual members of the public regarding TMP and other issues. DOT Construction will access, review and analyze work zone safety and monitor work zone operational measures (e.g., queue length, delay). DOT Construction will coordinate and work closely with DOT Communications on the preparation, release and dissemination of public information.

DOT Consultant Design – The Consultant Design Division has primary responsibility for the development of major, engineered design projects. Consultant Design is the lead administrative unit for ConnDOT’s consulting engineer contracts including general responsibility for coordinating pre-construction technical activities and reviews within ConnDOT. Consultant Design is a cross-cutting (rather than single discipline) unit. Consultant Design was the lead unit in preparing this TMP. Consultant Design will support implementation of the TMP by DOT Construction, principally in the areas of public information. Upon a request from DOT Construction, Consultant Design will participate in public information meetings and help prepare information pieces and responses to inquiries.

DOT Highway Operations (CHAMP) - The Connecticut Highway Assistance Motorist Program (CHAMP) is operated by Connecticut DOT and provides service throughout the Route I-95 SB portion of the construction. CHAMP services are described under the Incident Management heading of the Transportation Operations component. No adjustments of CHAMP service are planned.

DOT Traffic Engineering – Policy development and project-level review of traffic control devices, including TTC devices, are within the domain of DOT Traffic Engineering. The project M&PT will be reviewed by DOT Traffic Engineering Division as part of the normal design process prior to advertising. DOT Traffic Engineering also provides TTC-related construction consultation.

Partners – This category includes non-DOT organizations that provide specialized supporting contributions. The consulting engineer, construction contractor and State Police roles are outlined elsewhere and are not included in this category. Currently, MetroPool is the only identified partner but others may be added. MetroPool has an ongoing (i.e., separate from this project) relationship with ConnDOT to promote and support demand management. As outlined under the TO Plan, this role is expected to continue throughout the life of the project. Additionally, ConnDOT plans to engage CTRides to assist with creating and disseminating effective news releases. Through routine and close contact with major employers and regional

mobility interests, MetroPool may also provide feedback and observations that can be used for TMP monitoring.

Public Safety/State Police – Visible police presence is the most effective means of reducing work zone speeds. Visible police also support compliance with other TTC measures such as lane-use restrictions and merging. Further, certain operations including equipment and material movements involve short-term TTC alterations that are best implemented with assistance by police and/or police vehicles. For these reasons, State Police are routinely used on ConnDOT freeway projects. For this project, State Police will be used in conjunction with Route I-95 SB work. The conditions, protocols and administrative procedures associated with State Police assignments to ConnDOT construction projects are included with a bi-agency Memorandum of Understanding (MOU). Route I-95 SB is also part of a routine State Police patrol. If non-compliance with work zone traffic devices (e.g., speed limits) is determined to jeopardize worker or motorist or pedestrian safety, DOT construction will request work zone enforcement by the appropriate police agency, depending on location. Police on routine patrol, those assigned to the project and CHAMP patrols are incident management assets.

Partners – This category includes non-CTDOT organizations that provide specialized assistance and support. These partners include:

Town of Groton

Town of New London

Emergency Services

Major Area employers

Motor Transport Association of Connecticut

Rhode Island Trucking Association

For each major activity, a single unit is designated as having lead responsibility. However, a single unit does not typically have all the expertise and resources to independently perform these activities; support and cooperation from other units is usually needed. Support responsibility may involve advance review, collaborative development and problem solving or on-call expertise during implementation. Table 2 summarizes TMP roles and responsibilities.

Table 2: Overview of TMP responsibilities by organization.

| Unit or Organization | Impact assessment | TMP Component | | | | | | Monitoring |
|------------------------|-------------------|---------------|-----|------|-----|-------|-----|------------|
| | | TTC | | TO | | PO/PI | | |
| | | Prep | Imp | Prep | Imp | Prep | Imp | |
| Construction Contactor | | | 1 | | | | 2 | |
| Consulting engineer | | 1 | | | | | 2 | |
| DOT Consultant Design | 1 | 2 | | 1 | | 1 | 2 | |
| DOT Communications | | | | | | 2 | 1 | |
| DOT Construction | 2 | 2 | 2 | | 1 | | 2 | 1 |

| | | | | | | | | |
|--|--|---|---|--|---|---|---|---|
| DOT Highway Operations (CHAMP) | | | | | 2 | | | |
| DOT Highway Operations | | | | | 2 | | 2 | 2 |
| DOT Traffic Engineering | | 2 | 2 | | | | | |
| Partners (e.g., TMOs, other consultants & contractors) | | | | | 2 | 2 | 2 | 2 |
| Public Safety/State Police | | | 2 | | 2 | | | |

1 = Primary responsibility

2 = Support responsibility

Prep = Prepare TMP component

Imp = Implement TMP component

11. Implementation Summary and Contact Information

This TMP describes a series of actions, some completed and others planned for the future. The DOT unit(s) and other organization with primary and supporting responsibility are also identified. This concluding section summarizes and cross references significant TMP activities and roles. Contact information for each unit or organization with a designated TMP role is also provided. This information is included in Table 3 and Table 4, respectively. The information in this section is intended as a quick reference and management device, rather than a replacement for the more comprehensive activity descriptions.

Table 3: Summary TMP Action Plan.

| TMP Component | Action item | Responsible party |
|---|--|--|
| Temporary Traffic Control (TTC) | Develop construction sequence/staging plans | Consultant, Consultant Design |
| | Develop M&PT (i.e., minimum capacity and access requirements for specific facilities, designated detours, TTC device patterns and specification) | Consultant, Traffic Engineering, Consultant Design |
| | Identify and estimate M&PT pay items | Consultant, Consultant Design |
| | Fulfill contract requirements, including M&PT | Contractor, DOT Construction |
| | Initiate TTC revisions as determined by monitoring program | DOT Construction, Traffic Engineering, Consultant Design, Consultant |
| Transportation Operations (TO) | Coordinate with local officials | Consultant Design, DOT Construction |
| | Provide advance notice and coordinate with transit agency on detour route | DOT Construction |
| | Administer and coordinate MetroPool demand management activities | DOT Construction, MetroPool |
| | Coordinate with emergency response agencies, including CHAMP | Consultant Design, DOT Construction |
| | Administer and coordinate dedicated State Police presence | DOT Construction, State Police |
| | Establish Construction liaison | DOT Construction |
| | Monitor and document work zone operational effects | DOT Construction |
| Public Information/Public Involvement (PO/PI) | Hold public information meetings | Consultant Design, Consultant, DOT Construction |
| | Prepare news releases | DOT Communications, MetroPool, DOT Construction |
| | Release, disseminate and post news releases | DOT Construction |
| | Provide credible and timely information via CMS | DOT Construction |

Table 4: Contact information for TMP-related organizations.

| Organization | Contact information | | |
|-----------------------------|---------------------|----------------|--|
| | Name | Telephone | Email |
| BOC and CHAMP | BOC staff | (203) 696-2690 | |
| Construction Contractor | TBD | TBD | TBD |
| Consulting Engineer | Michael Egan | (203) 238-1969 | mike.egan@cardinal-engineering.com |
| Consulting Liaison Engineer | Ricky Mears | (860) 290-4100 | rmears@cmeengineering.com |
| DOT Consultant Design | Tim Fields | (860) 594-3217 | Timothy.Fields@ct.gov |
| DOT Communications | Kevin Nursick | (860) 594-3003 | kevin.nursick@ct.gov |
| DOT Construction | Ken Fagnoli | (860) 823-3276 | Kenneth.fagnoli@ct.gov |
| DOT Traffic Engineering | Mark Makuch | (860) 594-2722 | tracy.fogarty@ct.gov Mark.Makuch |
| Public Safety/State Police | TBD | TBD | TBD |

Please update the contact information for DOT Construction District 2.